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ABSTRACT

The online catalog discussed in this report extends the present microfiche union catalog development by providing online access to bibliographic records for the holdings of the University of California Libraries. The specifications for the user interface through which the library patron communicates with the online systems to locate materials are outlined, and the catalog's searching capabilities, display options, user information component, help facility, non-automated aids, terminals, consultation ability, and evaluation mechanisms are described. The report also examines the design criteria for the patron interface, the human-machine dialogue, the search component, the help function, the catalog's interlibrary loan function, and its bibliography-building capability. (FM)

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UNIVERSITY OF CALIFORNIA PROTOTYPE ON-LINE CATALOG

ED195272

Preliminary Specifications for the Patron Interface

Prepared by
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Section 1

INTRODUCTION

The Prototype On-Line Catalog extends the present microfiche Union Catalog development by providing on-line access to the bibliographic records for the holdings of the University of California Libraries. Experience gained from the Prototype On-Line Catalog will be used to develop the University's On-Line Library Catalog as outlined in the University of California Libraries: A Plan for Development.[1]

UC campus use of automated technical processing systems for current and retrospective cataloging contributes to the development of the on-line catalog. As part of Union Catalog processing, campus catalog records from technical processing systems are merged into a unified data base from which records for the on-line prototype will be selected.

This document outlines specifications for the Patron Interface through which the user communicates with the on-line system to locate materials. These specifications rely heavily on the SCUBAS report of March 15, 1979,[2] on reviews

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[1] The University of California Libraries: A Plan for Development, 1978-1988. Berkeley: Office of the Executive Director of Universitywide Library Planning, Systemwide Administration, University of California, 1977.

of existing on-line systems and on the literature of human-machine interaction.

1.1 THE IMPORTANCE OF THE PATRON INTERFACE.

The success of the prototype catalog will depend on the user's ability to communicate with the on-line system. It is important that the Patron Interface make the accumulated machine-readable records easily available to the user. Presently not much is known about how untrained users approach an on-line catalog. As one of the first on-line systems for untrained users, the UC prototype will offer an opportunity to test a number of communication techniques.

1.2 THE PATRONS.

The patron, not the computer, is the primary consideration of the Patron Interface. Design must take into consideration the user's experience, expectations, and reactions to an on-line catalog.

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[2] University of California. Steering Committee on the University's Bibliographic Access System. Outline of System Requirements for an On-Line Bibliographic Access System for the University of California Libraries. (Fifth Draft) March 15, 1979.

UC patrons are a heterogeneous group united only by their desire to learn about the holdings of UC libraries. DLA assumes that they will exhibit a wide range of experience in terms of library and computer usage. The interface must accommodate this range without placing a burden on any individual user. Inexperienced users must be able to use the catalog without extensive training, while experienced users must be able to search the catalog without having to enter or receive superfluous or redundant information.

1.3 OVERVIEW OF THE HUMAN-MACHINE DIALOGUE.

Because of the unique nature of the on-line catalog, a means of communication between the patron and the system is necessary. To accommodate the expected variety of user experience, three levels of interaction are proposed.

1. A guided mode will pace the user through the steps of using the catalog by asking the user to respond to instructions, prompts and menus supplied by the computer.

2. A tutorial mode will teach the user to use the system by offering instruction in any or all system features. Users in any mode will be able to re-enter the tuturial mode to learn new features or refresh old skills.

3. A user-initiated or command mode will allow the user to use the catalog quickly and directly through a simple command language, taught in the tutorial mode. To use the command mode effectively, the user must have some bibliographic and on-line expertise, which can be gained from use of the tutorial mode and separate written materials made available with the catalog.

The three modes of interaction are designed to accommodate a wide range of users and to provide a flexible approach to the catalog. The user's reported experience with these modes will do much to help DLA refine the human-machine dialogues designed for the full implementation of the on-line catalog.

1.4 COMPONENTS OF THE PATRON INTERFACE.

The Patron Interface consists of a number of components that either rely on or aid in the use of the human-machine dialogue.

1.4.1 Searching capabilities.

The primary function of the patron interface is to locate catalog records. Accordingly, searching capabilities are central to the success of the system. The system must attempt to provide maximum searching capabilities in a usable manner. Specifications for the search component are outlined in Section 4.

1.4.2 Bibliographic display options.

To meet the user's varying needs, the system will give the user a choice of bibliographic displays, with options as to the format and content of the display of retrieved records. Specifications for display are outlined in Section 4.4.

1.4.3 Information about the catalog.

To use the catalog effectively, the user must be informed about its contents and the relationship of the on-line catalog to other library catalogs and services. The informational component of the prototype will describe the contents of the catalog, library locations and services, the development of the catalog, and provisions for user feedback. Specifications for the informational component will follow in a later document.

1.4.4 Help.

The Help facility will allow the user to ask questions about the system functions and user requests in progress. Help may also be initiated by the system when the user enters a command that cannot be processed. Specifications for the Help component are outlined in Section 5.

1.4.5 Non-automated aids.

Awareness of the on-line catalog is the user's first step in learning how to use it. Press releases, signs, and printed guides will prepare the user for a productive and satisfying terminal session. Signs placed at the terminals will familiarize the user with the terminals and will explain how to get started. Specifications for non-automated aids will follow at a later date.

1.4.6 Terminals.

Terminals are a critical link between the user and the catalog, and must not impede the human-machine dialogue. The system must not require a specific type of terminal in order to function; however, it may be desirable to use specialized terminals adapted directly to catalog functions and

procedures. In addition, to the greatest extent possible, the use of a particular terminal should not burden the user by requiring exceptions to usual procedures.

1.4.7 Consultation.

During development of the prototype catalog, users will be able to communicate directly with design staff who will be available to listen to their comments and provide explanations. DLA will record and incorporate feedback from these dialogues to improve the system in an ongoing process. DLA plans to use the terminals and the phone system to carry on this dialogue. Specifications for consultation will follow in a later document.

1.4.8 Evaluation.

In addition to direct consultation, evaluation mechanisms will be built into the Patron Interface. The results of these evaluations will be used to modify the prototype and to develop design parameters for the on-line catalog. DLA is considering on-line questionnaires, statistical reports on catalog use, and user interviews in person. Specifications for evaluation will follow in a later document.

1.5 SUMMARY.

Combined, these elements describe the Patron Interface. Each element must contribute to the understanding of the catalog and facilitate its use. The Patron Interface design is based on the characteristics of library use and on the growing body of literature about human-machine interactions. Following is a series of principles proposed as design criteria.

Section 2

DESIGN CRITERIA FOR THE PATRON INTERFACE

The success of the Patron Interface can be evaluated only through user reactions. Thus, validation of the design must await actual patron use of the prototype. Nevertheless, DLA must base the initial design on certain principles assumed a priori to be beneficial to the user. These principles or design criteria include:

2.1 THE USER MUST BE IN CONTROL.

The user must always be able to control the terminal session. At any point in the session, the user should be free to consciously choose the mode of communication, the type of search, the use of tutorials, etc. In the computer-initiated mode, and to a lesser degree in the tutorial mode, the user relinquishes a measure of control to the system, but this must be a conscious choice, and there must always be the opportunity to switch modes within a session.

2.2 THE SYSTEM SHOULD BE EASY TO LEARN.

DLA postulates that a general user should be able to begin searching for catalog materials after 15 or fewer minutes of guidance. Further instruction should build on the initial introduction and should be packaged in units that the user can assimilate during brief sessions. This will allow the user to control the pace of learning. Tutorials should be organized by topic, each with a general introduction and specific elaborations short enough for an average session.

2.3 THE OPERATION OF THE SYSTEM SHOULD BE UNDERSTANDABLE.

The user should be able to understand the system as a bibliographic catalog providing information similar to that in hard copy catalogs, but with more flexible, sophisticated and comprehensive capabilities. The system should minimize user confusion and anxiety by describing functions in familiar terms with as little specialized jargon as possible.

2.4 THE SYSTEM MUST BE ABLE TO ADAPT TO THE USER.

The Patron Interface will not be one interaction but many, based on the user's experience, bibliographic needs, and desire to learn. The system must provide a means of functioning for users with any com-

bination of experience and needs. The user who has gained confidence and experience should be able to invoke the system's more sophisticated features. Likewise, the user who masters one aspect of the system may wish to use only the simpler features of another system component.

2.5 SYSTEM RESPONSES MUST BE COMPREHENSIVE BUT SIMPLE TO UNDERSTAND.

The system must avoid responding with computer-like statements, codes, or jargon. This is particularly true of error messages in which the system should plainly state the reason for the error, the type of response that the system was expecting, how to proceed, and how to ask for more information. In addition, the system must respond simply and seriously to the user without human pretensions and without being patronizing.

2.6 SYSTEM RESPONSES SHOULD BE CONSISTENT AND EXPECTED.

As the system will expect certain types of requests from the user, the user will expect the system to yield consistent responses. For example, a highly specific search should not retrieve a general result; and the entry of erroneous information should not result in a tutorial or long help message, but

rather in an error message and information on how to proceed. In the cases where the system does return an unexpected result, the response should indicate how the response is related to the orginal request. Thus a request for books by Mark Twain which retrieves Samuel Clemens should indicate that Twain is also known as Clemens. Screen formats should be consistent, with the same sort of information always appearing in the same position on the screen.

2.7 THE SYSTEM SHOULD NOT LEAVE THE USER HANGING.

The system should protect the user from getting lost in system-initiated or user-initiated loops. The system must detect repeated entry of identical information or responses of identical information and should return control to the user by providing the opportunity to explain the problem or try again. When this happens the user might be given the opportuntity to contact a librarian or a DLA consultant to help diagnose the problem.

2.8 THE SYSTEM MUST PROTECT THE USER'S SECURITY.

In the same way that the library does not make circulation records available, the system must protect users' identities and the contents of their searches.

This will be especially true of users who dial on with approved passwords and those who request that bibliographies be mailed to them.

2.9 SYSTEM RESPONSE TIME SHOULD BE ACCEPTABLE TO THE USER.

Response time should be consistent and commensurate with the type of activity in progress. It is possible that there will be a variety of acceptable response times depending on the type of activity. Simple parameter settings or requests for display might produce minimum response times, while searching may have a longer response time, in order to promote a more careful review of the search response. In addition, when the user request is known to produce a lengthy response time the user should be advised and given a choice of whether or not to continue. This can be handled on a request-by-request basis or by default if the user knows that the session will contain long searches and is prepared to wait.

These criteria are presented as a basis for design. They are not final and will be revised as users confront the prototype catalog.

Section 3

THE HUMAN-MACHINE DIALOGUE

The major goals of the human-machine dialogue are conciseness, simplicity and consistency. The dialogue will be designed to accommodate all levels of users without requiring special training or experience. Depending on the dialogue mode selected, the user's portion of the human-machine dialogue will be either a series of responses to menu/fill-in-the-blank prompts, or a command language consisting of command words and modifiers that initiate action by the system and result in a response, or a combination of both. The machine's portion of the dialogue will consist of responses in one of three modes selected by the user to accommodate his level of experience.

This section outlines the human-machine dialogue in greater detail.

3.1 USER INPUT.

The simplest form of command entered by the user will be a carriage return, a number, or a piece of information requested by the computer. These user commands will be initiated by specific machine instruc-

tions such as "Press carriage return for more information," "Type the number of the function listed above that you wish to use," or "Type the author's last name." A beginning user will be able to use the catalog in guided mode by supplying only responses to instructions of this type. After becoming more proficient through the use of tutorial mode, the user will learn to use the command language and thereby directly initiate transactions.

Any one of the modes will result in a command being issued in the command language, which will consist of a limited number of English-language words. Commands will all be in the same format and some synonyms and three-letter abbreviations will be accepted. A small core of commands will enable beginners to function adequately; more experienced users can add more complicated commands.

Unless logically impossible, any command can be issued at any time during the user session. A user, for example, would not succeed in displaying a record unless a search had been performed previously, but a new search could be started at any time.

User commands are of two types: they either use the catalog or set parameters to govern the entire user session.

Commands that use the catalog, which are described separately below, include Search (Section 4), Help (Section 5), Interlibrary Loan (Section 6), and Bibliography (Section 7).

Parameter settings may be issued at any time during the user's session, and the parameters set will remain in effect throughout the session or until reset by the user. Parameters will include such items as the mode of interaction (guided, tutorial, or user-initiated), the display format option, the sequence of searching (campus, region, system), the ordering of retrieved records, the language of works to be retrieved, etc. Until explicitly set by the user, default values will be supplied for each parameter.

3.2 THE MACHINE RESPONSE.

The response of the system to a user request must be consistent, clear and informative. The same request must always produce the same response under the same conditions. Error messages will be provided as needed, and they will be in the form of a computer- initiated help message containing instructions on how to correct the error, or containing guidance on where to go for more information about the function being used at the time the error was produced. The system design will

attempt to keep the user aware of exactly what is being undertaken and the options open at any given point in the session.

In addition to the nature of the machine response, response time must also be consistent. When the system detects that a user request will result in a longer than average wait, the system will so inform the user.

The nature of the machine's portion of the dialogue will be determined by the user when selecting a dialogue mode, thereby choosing the level of detail with which the machine will respond to user input. In order that no user ever feel helpless, this selection will be the first interaction of every session. Three dialogue modes, already mentioned in Section 1.3, will be available for different levels of experience. The dialogue mode may be reset at any point in the session. A user may, for example, be totally at ease in searching, but totally unfamiliar with processing an ILL request. Such a user would change to tutorial or guided mode before entering the ILL function.

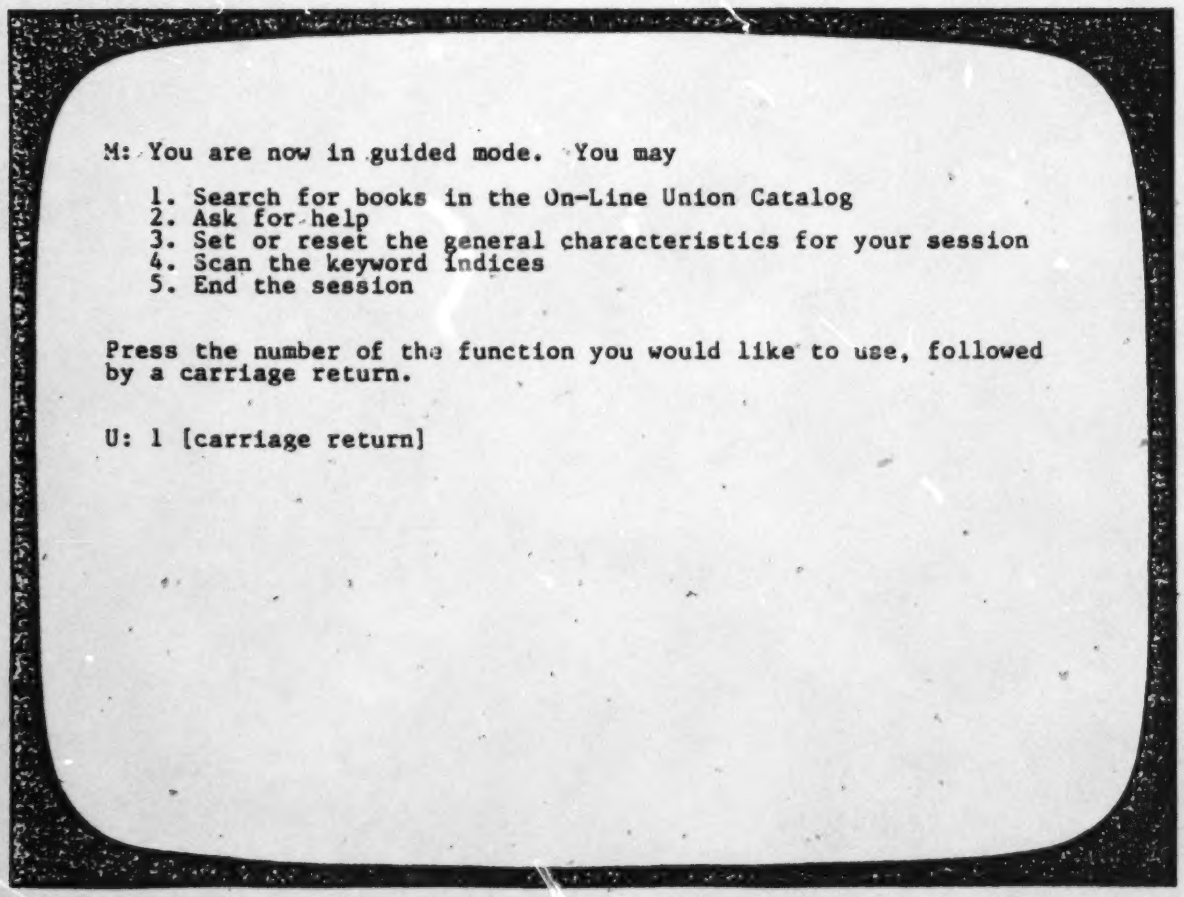
The three dialogue modes are described below.

3.2.1 Guided mode (menu selection/fill-in-the-blank).

Guided mode is designed for the occasional user who is not familiar with the system and is not interested in learning how to use command mode, but who does want to complete a search. Like tutorial mode, guided mode is structured to help the user locate any function, and choices are offered to the user for selection at all points. However, guided mode makes no effort to instruct the user in the use of command mode. The user will simply be offered a numbered menu of selections, and be asked to select items and type their numbers, but there will be no instruction in the formulation of the commands themselves. This will result in a faster session than tutorial mode, and will require no previous training, but it will not lead to more sophisticated use of the system.

The example texts below are by no means in their final form, and should be considered as rough drafts.

Example 1: A guided search.


M: You are now in guided mode. You may
1. Search for books in the On-Line Union Catalog
2. Ask for help
3. Set or reset the general characteristics for your session
4. Scan the keyword indices
5. End the session
Press the number of the function you would like to use, followed by a carriage return.
U: 1 [carriage return]

Screen 1.

```
M: The search function will locate books in the On-Line Union
   Catalog by searching for words or combinations of words in
   various parts of the catalog record. You may search on one or
   more of the following indices:

   1. Author
   2. Title
   3. Subject (the subject area which the book covers)
   4. Series (the name of the series, if the book belongs to a series)
   5. Control Numbers (such as Library of Congress Card Number)

   You may now do one of the following;

      Type "help [number]", followed by a carriage return, for
        information on the various search indices. Help will instruct
        you how to return to this screen.

          OR

      Type the numbers of the elements on which you wish to search,
        separated by a blank space, followed by a carriage return.

U: 1 3 [CR]
```

Screen 2.

M: Type the author's name. For a personal author type the last name first, followed by a comma, then type the author's first and middle names or initials, if known. Press carriage return at the end of the line to begin the search.

U: Sartre, Jean Paul [CR]

M: Type subject words you wish searched for, followed by a carriage return:

U: existentialism [CR]

M: Your search request,

"find author Sartre, Jean Paul and subject existentialism,"

retrieves 10 books. You may now

1. display all the books on one screen
2. display one or more of the books in the format of your choice
3. refine your search and reduce the number of books you retrieved
4. begin a new search
5. stop searching

Type the number of the action you wish to take, followed by a carriage return.

[etc.]

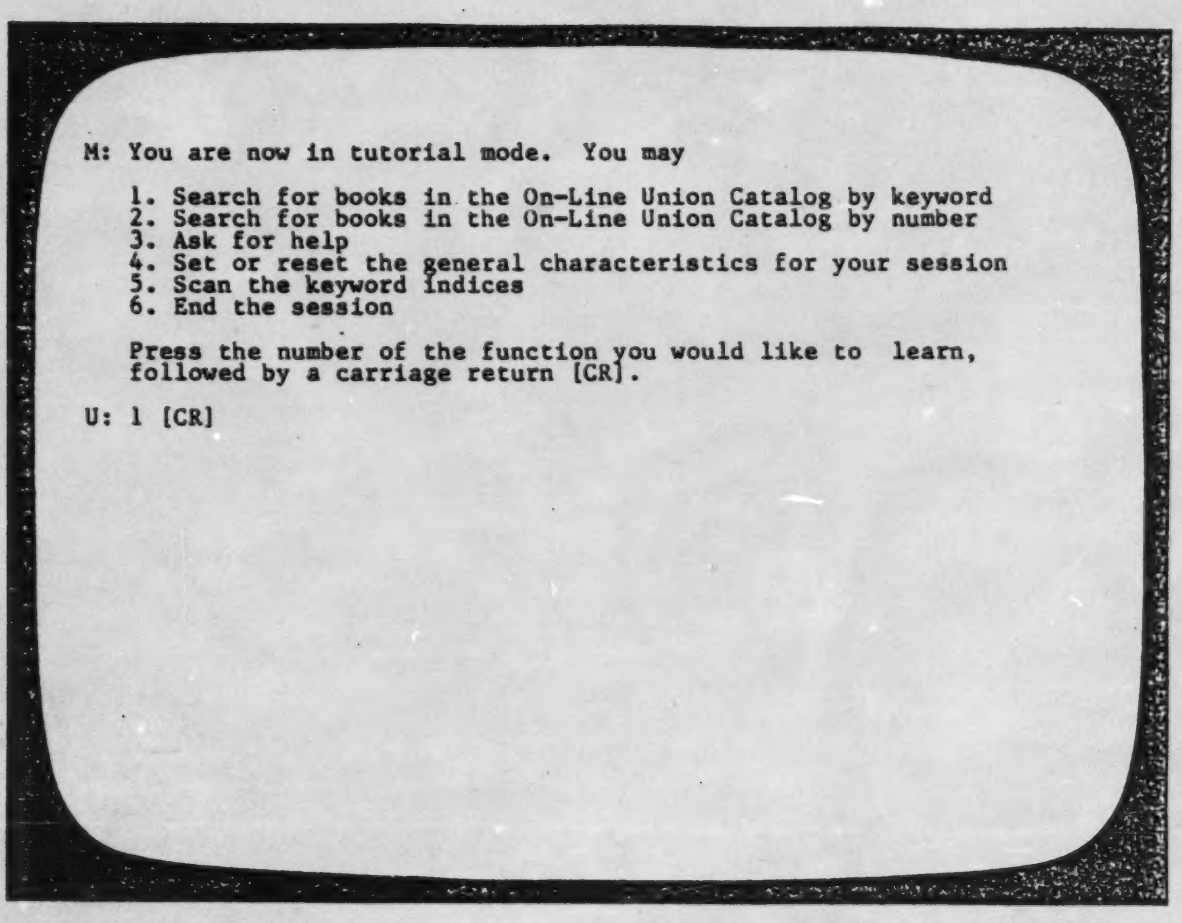
Screen 3.

3.2.2 Tutorial mode.

Tutorial mode, for the patron learning the system, will guide the user through all the steps of any aspect of any procedure requested. The user will still control the direction of the session, but it will be through the selection of alternatives offered rather than through the active initiation of a command. Exactly the same procedures are available to the user in any mode, but in tutorial mode they are presented for evaluation at every point in the session. When the user has selected an action, a full explanation of the activity underway is offered. Tutorial mode does not simply describe how to do something. It gives instructions in formulating a command and then asks the user to enter the command, after which it describes the result of the command.

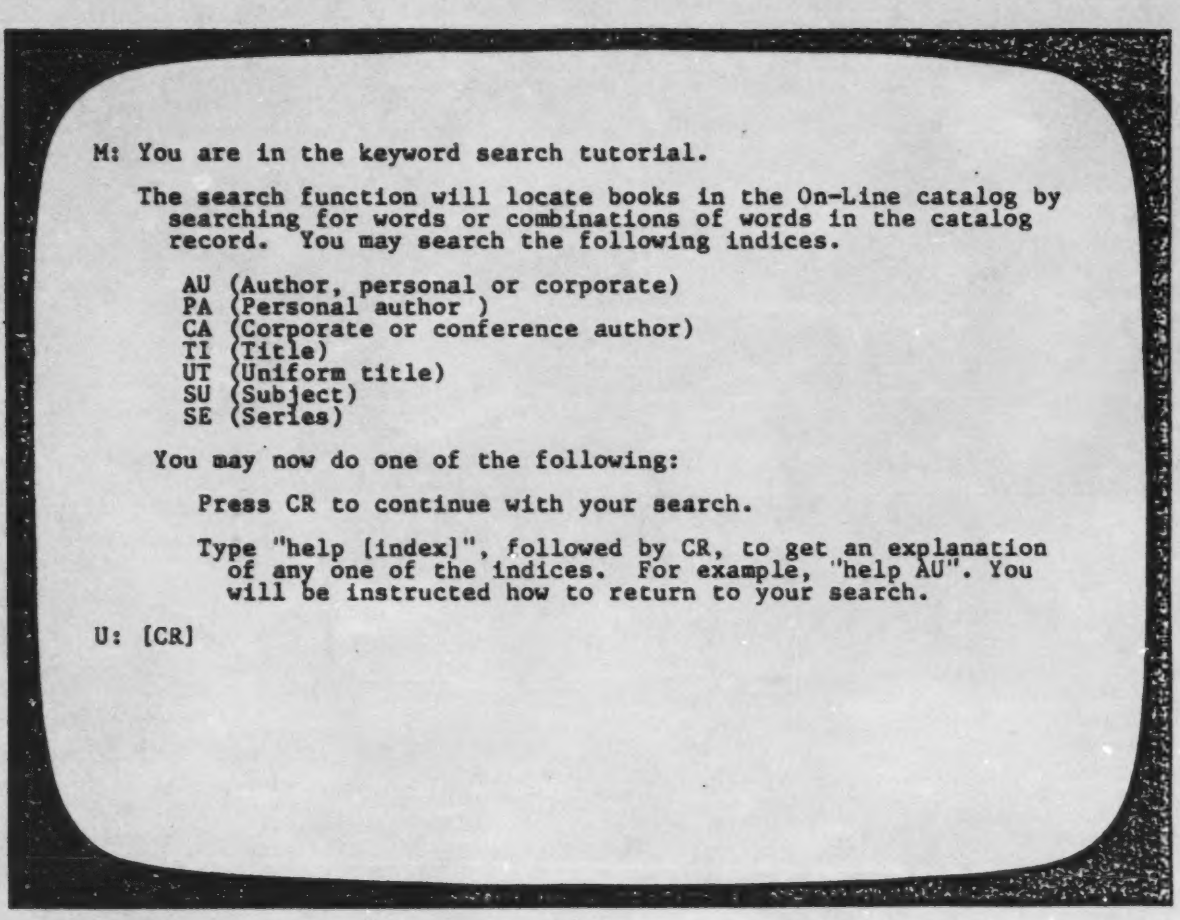
Tutorial mode will be hierarchically structured so that the user can locate a desired function quickly.

Example 2: A tutorial mode dialogue in which the user wishes to begin a search.


M: You are now in tutorial mode. You may
1. Search for books in the On-Line Union Catalog by keyword
2. Search for books in the On-Line Union Catalog by number
3. Ask for help
4. Set or reset the general characteristics for your session
5. Scan the keyword indices
6. End the session
Press the number of the function you would like to learn, followed by a carriage return [CR].
U: 1 [CR]

Screen 1.

Example 2: A tutorial mode dialogue (cont.)


M: You are in the keyword search tutorial.
The search function will locate books in the On-Line catalog by searching for words or combinations of words in the catalog record. You may search the following indices.
AU (Author, personal or corporate)
PA (Personal author)
CA (Corporate or conference author)
TI (Title)
UT (Uniform title)
SU (Subject)
SE (Series)
You may now do one of the following:
Press CR to continue with your search.
Type "help [index]", followed by CR, to get an explanation of any one of the indices. For example, "help AU". You will be instructed how to return to your search.
U: [CR]

Screen 2.

Example 2: A tutorial mode dialogue (cont.)

```
M: A search is made up of three sections:

        The command word FIND
        The search index desired
        One or more keywords from the desired search index

         For example:  find au Sartre, Jean Paul

    If you wish, you may combine several search indices.

         For example: find au Sartre, Jean Paul and su existentialism

    For hints or further instructions in constructing search
      requests, type "help search syntax" followed by CR.
      You will be instructed how to return to this screen.

    You may now enter your search request, followed by a CR.
      If you are unsure of how to proceed, use one of  the
      search requests above, or type "help", followed by a CR.

U: find au sartre, jean paul and sub existentialism [CR]

     [etc.]
```

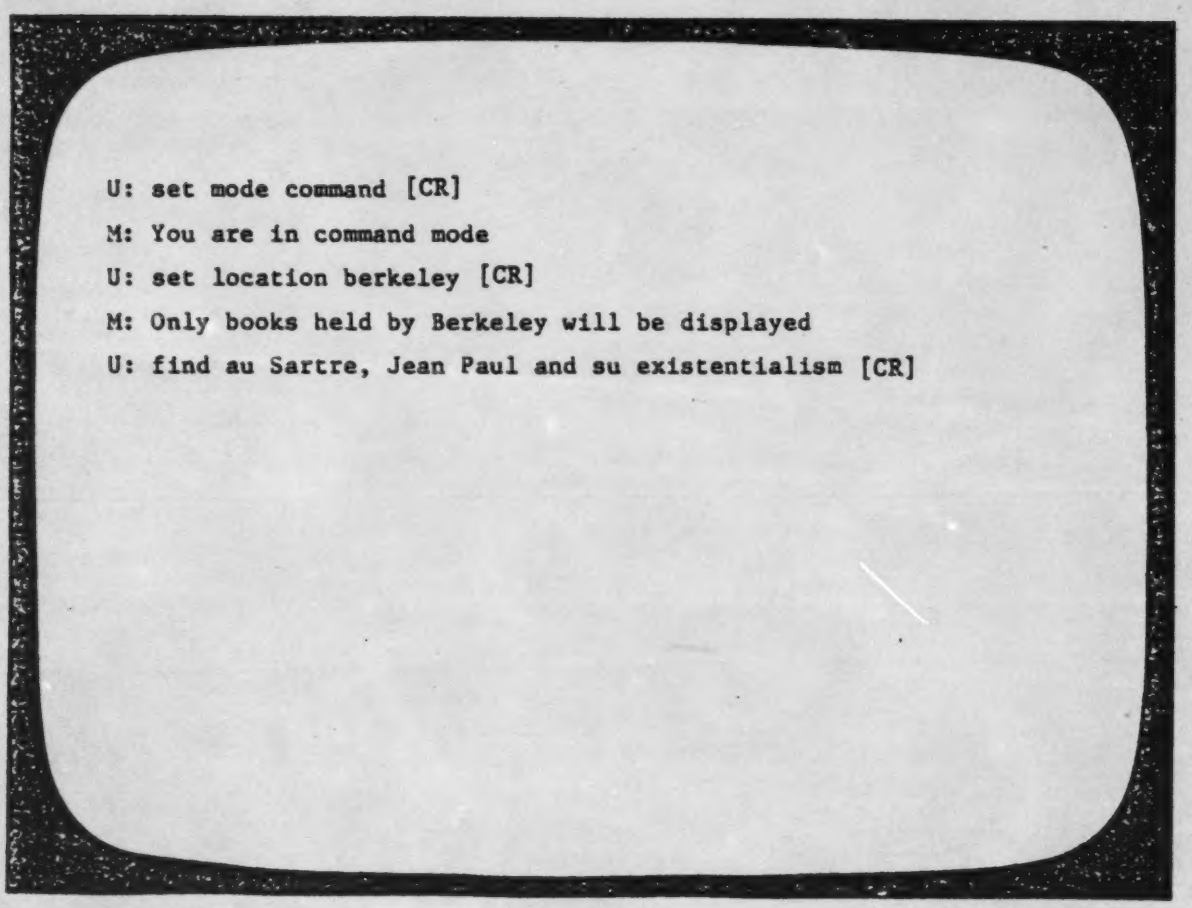
Screen 3.

3.2.3 User-initiated or command mode.

The experienced user will want only minimal response from the machine and will initiate almost all activities without prompts. After responding to a request, the machine will wait for the user to enter the next command. In order to save the user time, the machine will respond with the minimum information required to inform the user fully of the results of a request. It is understood that no one would use this mode without prior knowledge gained from tutorial mode or from written materials.

If the inexperienced user mistakenly selects command mode, it is expected that he or she will very soon request help. In order to rescue such a user, any help response issued to a user in command mode will tactfully suggest changing to tutorial or guided mode.

Example 3: A command mode dialogue in which the user undertakes a search.


U: set mode command [CR]
M: You are in command mode
U: set location berkeley [CR]
M: Only books held by Berkeley will be displayed
U: find au Sartre, Jean Paul and su existentialism [CR]

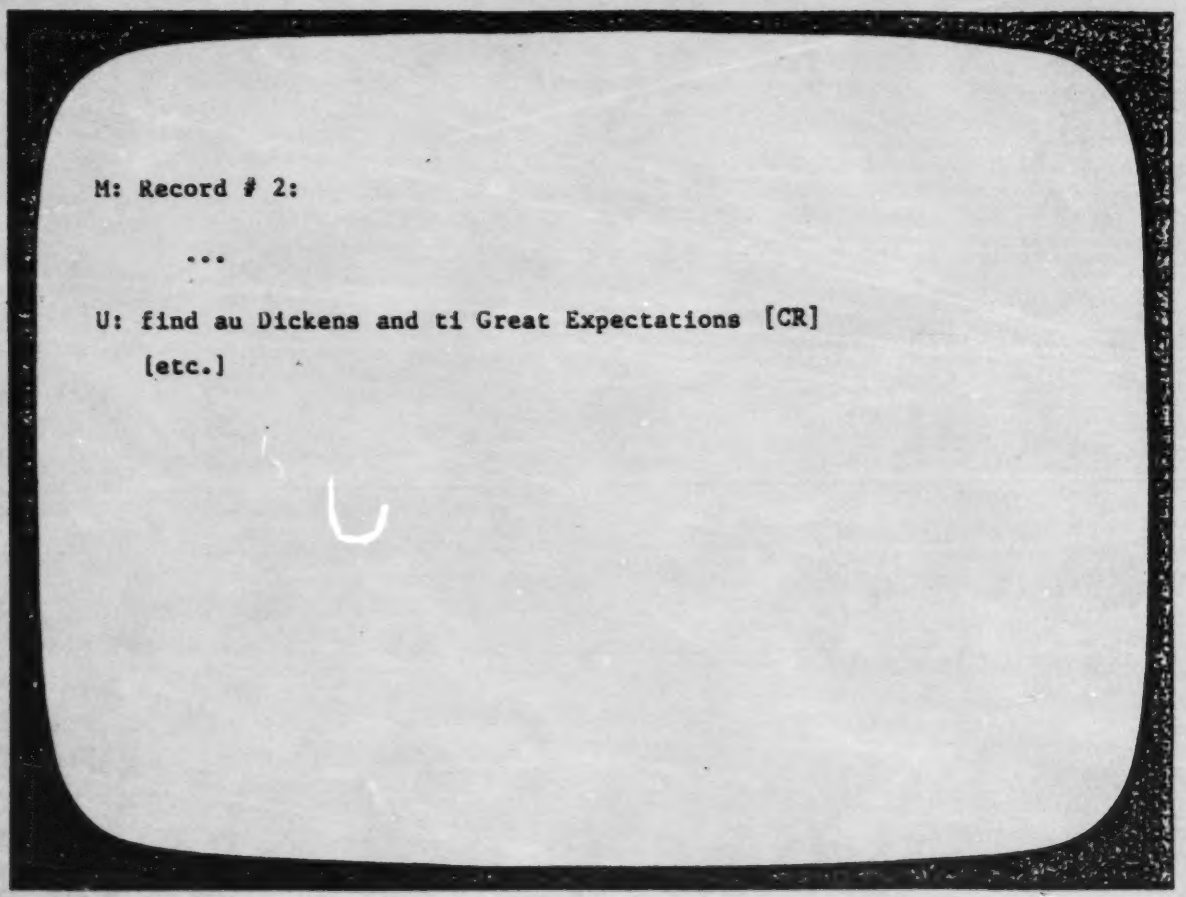
Screen 1.

Example 3: A command mode dialogue (cont.)

```
M: "find au Sartre, Jean Paul and su existentialism"
   retrieves 10 books.

U: display brief [CR]

M: Record # 1:

     ...

   Record # 2:

     ...

   Record # 3:

     ...

   (press carriage return for more records)

U: display 2 full [CR]
```

Screen 2,

Example 3: A command mode dialogue (cont.)



Screen 3.

Section 4

THE SEARCH COMPONENT

The capability to search for catalog records is the heart of the on-line catalog and its major function. All other functions facilitate the search function or use its results. User satisfaction will depend on success in retrieving information about UC holdings from the catalog. Successful searching will result from the interplay of a number of factors including:

+ The restriction of the libraries covered by a search.
+ The query language, or the set of commands that the patron uses to access the catalog.
+ The search indices, or the access fields that the patron uses to locate desired items.
+ Search responses, or the results of a search request.
+ Display, or the format in which the results of a search request are presented.
+ Keyword scanning, or the added capability to display portions of the search indices to help refine a particular search.

These factors interrelate to form the searching capability, and are described in greater detail below.

4.1 RESTRICTION OF LIBRARIES TO BE SEARCHED.

The user will be given the option of specifying which libraries shall be included in the search area. Any combination of libraries, or a region, may be selected. Only records held by libraries the user has included in the search area will then be displayed. After retrieving the results from a search, the user may ask for the results of the same search for a different search area, without reentering the search.

The selection of libraries to be searched will be a parameter which is effective throughout the session or until reset by the user. If the user does not set the search area, it will default to the user's own campus.

4.2 THE QUERY LANGUAGE.

The query language, which is a subset of the overall command language, is the basis of all searching in the prototype catalog. It consists of a series of commands that allow the user to access the catalog. The commands actually processed by the search software are the same whether the search is made in the guided,

tutorial, or command mode. In guided and tutorial searches, the computer will build the appropriate command from the information it elicits from the user, whereas in command mode the user will enter the search command directly.

4.2.1 Syntax elements.

Every search must contain at least three elements:

4.2.1.1 The command word.

The command word informs the system that the user wants to search. The command word will be one of a finite list of command words such as "find" or "search." The command word also makes it clear to the user which function is being invoked, and distinguishes the search command from similarly constructed commands such as that used for the keyword scan.

4.2.1.2 The search index.

The search index identifies which access point is being used. The indices, such as author, title, subject, etc. are enumerated in section 4.3 below.

4.2.1.3 The search key.

The search key identifies the words or numbers being sought. Search keys will consist of numbers such as the LCCN, or combinations of keywords such as author surname, title word, subject word, etc. For keyword searches, such as author or title searches, the user may enter several keywords, and the system will retrieve all records containing all the keywords requested.

A typical search might be "FIND TITLE GREAT EXPECTATIONS," which would retrieve all records containing the words "great" and "expectations" in a title field. Depending on the user's needs, this could be desirable or undesirable. Therefore, additional search features will be available.

4.2.2 Additional features.

The user may refine or expand the search by use of the following additional features.

4.2.2.1 Conjunctions.

More complex Boolean searches may be performed by combining several simple search requests with the conjunctions "and," "or" or "and not"; for example, "FIND AUTHOR FREUD AND TITLE PSYCHOANALYSIS."

Keywords within a search request may also be linked with conjunctions; for example, the search request "FIND SUBJECT ENERGY AND NOT SOLAR" would retrieve all books containing subject headings containing "energy" but not "solar."

Parentheses may be used to clarify a search command; for example, "FIND SUBJECT ENERGY AND (SOLAR OR GEOTHERMAL)" would retrieve all books that had subject tracings containing both words "energy" and "solar" and all books that had subject tracings containing both words "energy" and "geothermal."

If no conjunction is inserted between keywords, "and" is implied.

4.2.2.2 Keyword modifications.

Any keyword can be refined or broadened to make the search more or less specific. The following modifications will be allowed:

1. Truncation. This provides a generic search for all keywords that begin with the characters entered. A title search on the truncated keyword "libr" will retrieve all titles containing any word having "libr" as its first four letters. There will be a lower limit to the number of letters that can be used in a truncation search.

2. Phrase. A search on a phrase will return only records containing the keywords in the order entered and in adjacent positions. A title phrase search on "air pollution" will retrieve the title "Air pollution in California" but not "The pollution of California's air."

3. Literal search. A literal search will retrieve only records that exactly match the entered search key. A literal title search on "Sleeping Beauty" will retrieve only titles that consist wholly of the words "Sleeping Beauty."

4.3 ACCESS POINTS.

The patron will be able to search for catalog records through several different categories of access points.

4.3.1 Fixed format control numbers.

The simplest type of search will be through fixed format control numbers. For these searches the patron will enter the search index and the number desired. In most cases, each number will retrieve one record. If multiple hits are retrieved, they will be displayed for user review. The control numbers to be used for access to the prototype on-line catalog will be:

1. Union Catalog register number

2. LCCN (Library of Congress Catalog Card Number)

3. ISBN (International Standard Book Number)

4. OCLC number (record number in the OCLC technical processing system)

5. RLIN number (record number in the RLIN technical processing system)

6. ISSN (International Standard Serial Number)

4.3.2 Primary keyword search indices.

More versatile are keyword searches. Keyword searches will be performed on single words or Boolean combinations of words. Those that can be used to initiate a search are known as primary keyword searches, and the indices include:

1. Personal Author, including main and added entries.

2. Corporate/Conference Author, including main and added entries.

3. Non-Specific Author, including both (1) and (2). This is to be used when the searcher

either cannot discriminate between personal and corporate author or wants to retrieve both.

4. Title, including all title fields, all series statements unless traced differently, and all series tracings.

5. Uniform Title, including all uniform title fields.

6. Series, including all series statements unless traced differently, and all series tracings.

7. Subject, including all subject tracings.

It is expected that most search requests will use types 3, 4, and 7. The other search types are provided for the sophisticated user, and will facilitate more specific and consequently faster searches.

Access through campus call number will be deferred until the full implementation of the On-Line Catalog.

4.3.3 Qualifying search indices.

A third category of search index contains items which are not unique enough to be used efficiently to access the catalog directly, but which are useful in refining a set of retrieved records. Qualifying search indices may be used only in combination with one or more primary search indices. Thus "FIND AUTHOR SIGMUND FREUD AND PUBLISHER NORTON" is permissible, but "FIND PUBLISHER NORTON" is not. Initially the qualifying search indices will include such items as:

1. Publisher
2. Place of publication
3. Edition
4. Publication date
5. Language of the text of the work
6. Chronological coverage of the work
7. Geographic area covered by the work

4.4 AUTHORITY CONTROL.

The On-Line Union Catalog will be passed through authority control processing, in which variant forms of a name are replaced by a single form, known as the authoritative heading. Fields which are subject to authority control will be accessible through any form of the name. Books by "Samuel Clemens," for example, will be retrieved by a search for either Mark Twain or Samuel Clemens.

To accomplish this, access to the catalog by primary keyword searches will be through heading indices derived from authority-controlled records, which link all forms of a given name. Each heading appearing in the union catalog will be indexed by keywords from all its forms, both authoritative and non-authoritative. Each form of a heading will be linked in turn to all union catalog records containing that heading.

The basis for the authority control provided will be the Library of Congress Machine Readable Name Authorities (LC MARC Name Authorities), a regularly distributed tape series including authoritative headings linked to their variant forms. Only names appearing on these tapes will be linked to their variant forms. DLA has no plans for authority control of subject tracings until the Library of Congress begins

regular distribution of machine readable subject authority records.

Displayed catalog records will contain the authoritative form of headings only, except for the full MARC display format (see Section 4.6.4), which will include campus variants. When a user retrieves a record which uses a form other than that which was searched, a message will be generated such as the following:

Your search "FIND AUTHOR TWAIN" retrieves
Samuel Clemens, also known as
Mark Twain

4.5 SEARCH RESPONSES.

A search, whether in guided, tutorial or user-initiated mode, will usually consist of a series of interactions between the user and the computer.

A user may modify a search request at any time after a set of records has been retrieved, and thereby refine the retrieved set. The user may initiate a new search (or may ask to be guided through one) at any time during the session, by entering the appropriate command word. Starting a new search will destroy the results of any previous search.

The type of computer response, after a search request has been entered, depends on the number of records retrieved by the search:

4.5.1 No records retrieved.

If the search request retrieves no catalog records, a message will be displayed to that effect. The user may then begin another search or switch functions.

4.5.2 One screenful of records retrieved.

If the user's search request retrieves a small enough set of catalog records to be displayed individually on one screen, each one will be displayed in a brief format, alphabetized by the elements that were used in the search request. The user may then request that any one be displayed in another format. Section 4.6 describes the various display formats.

4.5.3 More than one screenful of records retrieved.

If the retrieved records cannot be individually displayed on one screen, the system will respond by allowing the user to choose a subset of the retrieved records for display. Two situations are anticipated:

4.5.3.1 Review display of records.

The retrieved records can be organized on the screen in a numbered display for review. Each number will represent a group of records having one or more elements in common. The user then selects one number for expansion, and the records represented by that number are then displayed individually. This process may be repeated until the user has located the desired record. Section 4.6.1 describes the numbered review display.

4.5.3.2 Review display of headings.

The retrieved records cannot be organized into a numbered review display because the number of author-title combinations is too large, but the number of headings (perhaps uniform title headings or subject headings) retrieved is small enough to display individually on a single screen. Here the retrieved headings are displayed and the user is asked to select the one or ones to be used in the search. The system then repeats the search using the selected heading(s).

4.5.4 Excessive retrievals are predicted by the system.

The user may enter a search on a term that would retrieve a number of records exceeding a predefined limit. In this case, neither headings nor records will be displayed, and the user will be notified of the situation and asked to refine the search. This could possibly be modified so that the user would be able to see a representative number of retrievals to aid in refining the search.

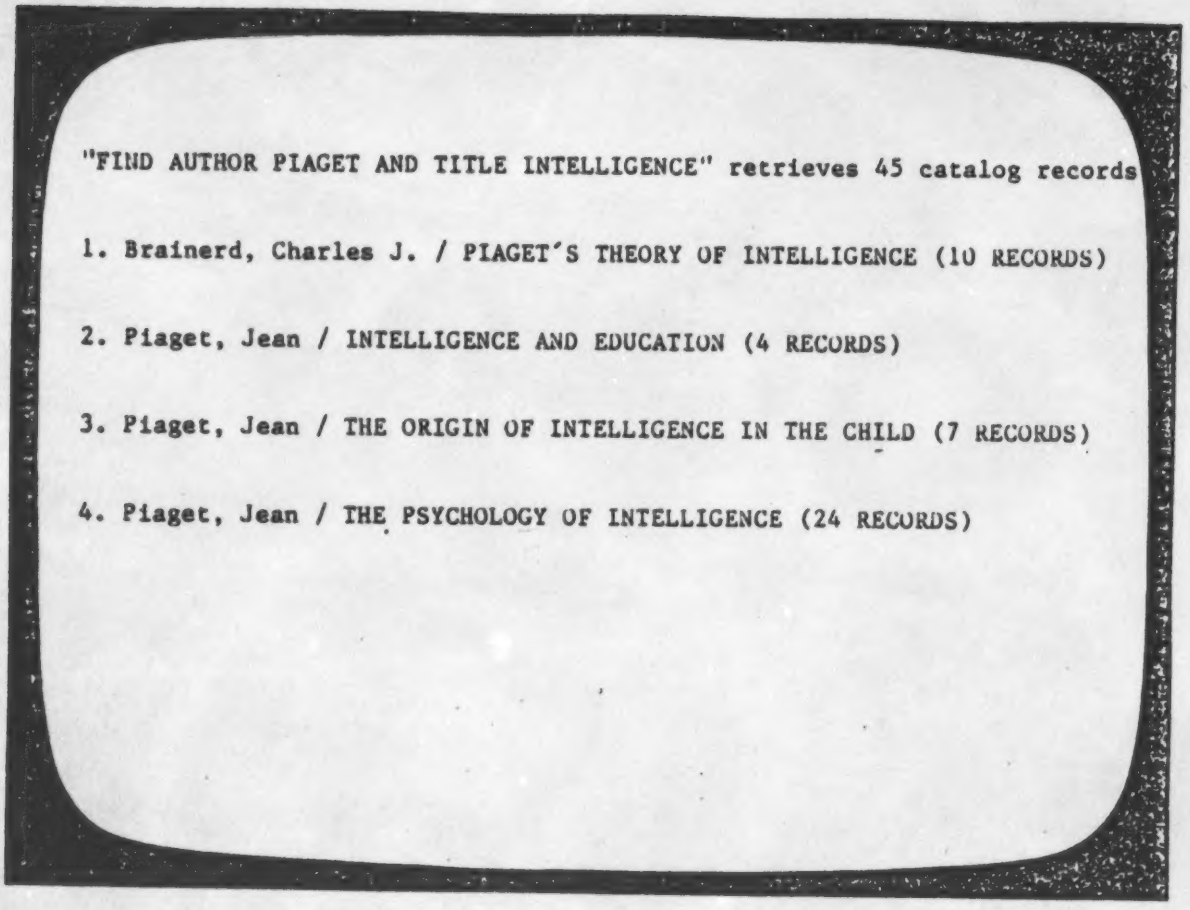
4.6 DISPLAY FORMATS.

It will be possible for catalog records and headings to be displayed in a number of different formats, which can be selected by the user.

4.6.1 Numbered review listing.

This format will be used when multiple headings or books have been retrieved. The retrieved set will be grouped according to words or elements held in common. Each group will be numbered so that the user can select one or more for expansion. It should be possible to display the entire result of a search request on one screen in this format. The grouped items will be alphabetized by the search index that was entered first by the user. The user may ask for alphabetization on a different index.

Example 4: Numbered review display. (The first group of records was retrieved through the added entry.)


"FIND AUTHOR PIAGET AND TITLE INTELLIGENCE" retrieves 45 catalog records
1. Brainerd, Charles J. / PIAGET'S THEORY OF INTELLIGENCE (10 RECORDS)
2. Piaget, Jean / INTELLIGENCE AND EDUCATION (4 RECORDS)
3. Piaget, Jean / THE ORIGIN OF INTELLIGENCE IN THE CHILD (7 RECORDS)
4. Piaget, Jean / THE PSYCHOLOGY OF INTELLIGENCE (24 RECORDS)

4.6.2 **Brief display.**

A brief display will consist of two or three lines for each book retrieved. These will be numbered so that the user can select one or more for fuller display. This format would be requested by the user for detailed, but quick, examination of records when the review display was not precise enough, or for printing a bibliography of books.

Example 5: Brief display

Record number 15 of 45

Piaget, Jean, 1896-
The origin of intelligence in the child.
Penguin Books, 1977, c1936.

SD Central BF721 .P473 1977

4.6.3 Paragraph format display-

A paragraph format display of union catalog records will present each union catalog record in a format similar to that of a catalog card.

Example 6: Paragraph display

Record number 15 of 45

Piaget, Jean, 1896-

The origin of intelligence in the child / Jean Piaget; translated by Margaret Cook. -- Harmondsworth ; New York : Penguin Books, 1977, c1936.

464 p. ; 18 cm. -- (Penguin education)

Translation of La naissance de l'intelligence chez l'enfant.

1. Child development. 2. Intellect.

SD Central BF721 .P473 1977

4.6.4 Full MARC display.

This will be a display of a single union catalog record in the full MARC format, with leader and all fields, tags, and indicators, similar to the present Union Catalog register display.

Example 7: Full MARC display

```
Record number 15 of 45

  Register No. 004-74609

  Author        100 10  Piaget, Jean,$d 1896-
  Title         245 14  The origin of intelligence in the child /
                          $c Jean Piaget ; translated by
                          Margaret Cook.
                260 0   Harmondsworth ;$a New York :$b Penguin
                          Books,$c 1977, c1936.
                300     464 p. ;$c 18 cm.
                490 0   Penguin education
                500     Translation of La naissance de
                          l'intelligence chez l'enfant.
  Subject       650 0   Child development.
  Subject       650 0   Intellect.
  Control data
                LDR     (5) STATUS  n      (6) TYPE  a  (7) BIB LEVL  m
                        (17) ENCD LEV  I   (18) CAT FORM i
                008     (0-5) entered 780512          (6) DATE TYPE c
                        (7-14) DATE(S) 1977,1936  (15-17) COUNTRY  nyu
                        (29) CONF PUB  0   (30) FESTSCHR  0
                        (31) INDEX  0      (32) ENTRY/BODY  1
                        (33) FICTION  0    (35-37) LANGUAGE  eng
                        (39) CAT SOURCE  d
                035     SDL $c 0C3888053
                040    $d CU-S .
                041 1   engfre
                090     SD   Central  BF721 .P473 1977
```

4.7 KEYWORD SCAN.

Should the user be interested in perusing an alphabetical listing of keywords, it will be possible to scan the keyword indices for any primary search type. Entering a particular keyword will produce a listing of keywords in the alphabetical area surrounding the keyword entered. For example, a command such as "scan title library" would produce a listing of keywords from the title file:

```
librarian
librarianship
libraries
library
librium
libs
lichens
```

Section 5

HELP

The Help function is designed to give the user information and problem-solving advice by defining terms, explaining error messages, explaining functions, and describing options open to the user.

Help messages will accommodate all levels of users, and the messages will be graduated in level of detail. Help requests can be invoked at any point in the session and may be as general or specific as the user desires.

5.1 ORGANIZATION OF HELP MESSAGES.

Help will respond to the user in the same dialogue mode previously specified by the user. Each help screen will be followed by the opportunity to go into greater detail, so that the user receives only as much help as is needed. Where appropriate, a help screen will direct the user to other functions, perhaps other help requests, to provide related information. Invoking Help will not interfere with any user activity in progress. When the user indicates that enough information has been obtained, the system simply returns to the point from which help was called.

The Help function is closely related to the tutorial dialogue mode. DLA expects that much of the text in the help messages will be integrated into the tutorial dialogues. However, by using Help, the user will receive messages more specific to particular needs, while tutorial mode will progress through a predefined course.

Help sequences will be available for all varieties of user: the computer programmer who knows nothing of libraries might enter "help catalog," while the librarian who knows nothing of computer logic might enter "help Boolean."

5.2 UNQUALIFIED REQUESTS FOR HELP.

If a user cannot define a specific need for help, an unqualified "HELP" may be entered, which will produce a response relevant to the function currently being used. If the user is not engaged in a particular dialogue, such as searching, the system will ask questions to determine the specific need for help, until the user obtains the information needed to solve the problem. If a continuous dialogue is in progress, or if an error message has just been received, the user will receive information tailored to the situation. This will include information as to the exact status

of the dialogue, and instructions in proceeding with the activity.

5.3 SPECIFIC REQUESTS FOR HELP.

A user may alternatively qualify a help request with any word from the command language. A qualified help request will invoke a series of help screens relevant to the term entered, each giving more detail than the last. A help request for a far-reaching term like "SEARCH" would involve a greater number of screens than one for "AUTHOR" which involves only a few possible commands. Such a help request would most likely receive in response first a definition of the term entered, followed by explanations of its use in graduated levels of detail.

Section 6

INTERLIBRARY LOAN

The interlibrary loan component of the on-line catalog, a subfunction of search, will facilitate processing of ILL requests by campus ILL departments. The ILL function can be used only after a search has produced a catalog record. This component will be implemented, after campus consultation, in two phases.

6.1 PHASE I.

It is likely that in the early years of the on-line catalog, when the Union Catalog represents only a small portion of total UC holdings, there will be a fairly large number of requests for books already resident at the user's campus. In the first phase, therefore, the ILL function will simply produce a filled-out ILL request form on a printer either on the user's campus or centrally located, using the information in a retrieved catalog record. The system will query the user to obtain personal information. The user can then submit the completed form to the ILL department of the local campus for screening.

6.2 PHASE II.

As the Union Catalog becomes more representative of campus holdings, the second phase will be implemented. ILL requests will be generated as in Phase I, and will then be automatically transmitted to the ILL department of the closest campus showing holdings in the Union Catalog.

Section 7

BIBLIOGRAPHY

A second subsidiary function of the search component is the ability to build a bibliography. A patron who has retrieved a set of records will be able to store them in a private file or bibliography. Subsequent search results can be added to this file. When the bibliography is complete, the user will be able to arrange it by any of a number of filing elements, eliminate extraneous records, and request off-line printing in any of the display formats described under SEARCH. Initially, printing will be done at a central location, and the listing mailed to the user.